



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,674	03/24/2004	Takahiro Ishikawa	789_126	4305
25191 7590 03/16/2007 BURR & BROWN PO BOX 7068 SYRACUSE, NY 13261-7068			EXAMINER DINH, TUAN T	
			ART UNIT	PAPER NUMBER
			2841	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/16/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

10/807,674

**Applicant(s)**

ISHIKAWA ET AL.

**Examiner**

Tuan T. Dinh

**Art Unit**

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### *Claim Objections*

2. Claims 9 and 11 objected to because of the following informalities:

Claims 9, 11, line 1, change "A heat spreader" to - - The heat spreader - -.

Claim 8, line 9, the phrase of "said active element being contained in an amount ranging from 400 to 1000  $\mu\text{g}/\text{cm}^2$ " is not understood. What does applicant mean of "the amount" refer to? Does applicant mean of "the amount" of the active element as a weight or density?, if the density, please, check the unit (mass per cubic cm).

Appropriate correction is required.

**Noted:** the reference Ishikawa et al. (U.S. Patent 6,110,577) shows in figure 3 that the copper having a thermal conductivity greater than 150W/mK.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (6,261,703).

As to claims 8, 10, Sasaki et al. discloses a heat spreader module as shown in figure 13 constructed by supplying active hard brazing materials each containing: an active element (2c), formed between a pedestal (1b), a heat spreader member (3b), an insulating board (1a), and a metal plate (2a), and pressing and heating said pedestal, said heat spreader member, said insulating board, and said metal plate to melt said active hard brazing materials, thereby joining said pedestal, said heat spreader member, said insulating board, and said metal plate together, said active hard brazing materials being supplied such that said active hard brazing materials have a thickness ranging from 3 to 20  $\mu\text{m}$  (column 8, lines 30-34) when said active hard brazing materials are melted, and said heat spreader member having a thermal conductivity of 150W/mK or greater (the heat spreader is a conductor layer made by copper (Cu) having thermal conductivity of greater than 150W/mK, see noted as above).

Sasaki et al. does not specific disclose the amount of weight of the active element in a range of 400-100  $\mu\text{g}/\text{cm}^2$  and the metal plate having width within a range of 200  $\mu\text{m}$ .

It would have been obvious to one having ordinary skill in the at the time the invention was made to have an amount of weight in a range of 400-100  $\mu\text{g}/\text{cm}^2$  of the active element in order to provide excellent bonding and the metal plate having width within a range of 200  $\mu\text{m}$  in order to provide minimum sized and easy for pressure and melt, bond on the insulation board, since it has been held that where the general condition of the claim are disclose in the prior art and discovering an optimum value of

a result effective variable involves only routine skill in the art. In re Aller, 105 USPQ 233 and In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to claims 9, 11, Sasaki et al. discloses said metal plate (2a) has an alloyed (brazing alloy) region including constituent elements of said active hard brazing materials.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 8-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kobayashi et al., Ishikawa et al., Kim et al. Hirao et al. Arai et al., and Kurihara et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reichard Dean can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Tuan Dinh', with a long horizontal stroke extending to the right.

Tuan Dinh  
March 06, 2007.